

does not impose any structural limitations upon the claimed apparatus which differentiates it from a prior art apparatus satisfying the structural limitations of that claimed.”

Applicants respectfully traverse. Applicants respectfully direct Examiner’s attention to Fig. 1 of the specification. Fig. 1 is a cross section of a general shell-and – tube heat exchanger. The heat exchanger has a vent pipe 6, a drain pipe 7, and two sets of fluid passing ports, i.e. a tube side fluid passing port 2 and a tube side fluid passing port 3, and a shell side fluid passing port 4 and a shell side passing port 5.

The Examiner states in the Office Action, communication paper No. 12, mailed on July 27, 2003, that the Examiner is relying on the prior art of (Kieren) drain pipe 33 in the lower tube sheet 19. However, the drain pipe 33 of Kieren corresponds to the fluid passing port 4 in Fig. 1 of the present specification in that pipe 33 passes through partition 19. Furthermore, in Kieren, the numeral 33 combined with the numeral 30 constructs one set of fluid passing ports, as described on page 2, lines 5-15. Further, Kieren teaches on page 1, left hand column 1, lines 41-43 “a valved mud-draw-off pipe 9 for the purpose of discharging the mud or other impurities which may be deposited thereon”. Accordingly, in Kieren, if the numeral 33 refers to the drain pipe then presumptively this drain pipe can discharge the mud or other impurities which may be deposited. However, numeral 33 is used to withdraw fluid from numeral 30 (see page 2, left hand column, lines 8-10 of Kieren) so that the numeral 33 corresponds to the fluid passing port 4 in Fig. 1 of the present specification.

In contrast, the present invention is directed to a vertical heat exchanger that includes a drain pipe having at least part of one end of which being made of a lower tube sheet part and the other end of which connected outside the heat exchanger to an immediately adjacent second fluid passing port passing the same fluid as the drain pipe, as described in claim 1.

Kieren describes a concave head 8 which is provided with a valved mud-draw-off pipe 9. Pipe 9 is attached to concaved head 8, but not to the lower tube sheet, as

described in the present invention. The fitting place of the drain pipe in Kieren is different from that of the invention defined by the present claims. Furthermore, the vent-pipe in Kieren cannot be made of the lower tube sheet. In addition, Kieren does not teach or suggest that the other end of the drain pipe can be connected outside the heat exchanger to an immediately adjacent second fluid passing port passing the same fluid as the drain pipe (see Fig. 9 of the present invention).

In accordance with the drain pipe of the present invention, the fluid in shell 611 can be fluidized and the overall heat exchange efficiency of heat exchanger 601 can be improved, as described on page 4, lines 17-30 and in Fig. 6.

Kieren teaches that concave head 8 is provided with a valved mud-draw-off pipe 9 for the purpose of discharging the mud or other impurities (page 1, lines 40-44) that accumulate. In accordance with Kieren, the mud or other impurities are discharged from the water supply line or inlet pipe. In contrast, the present invention uses the drainpipe to discharge mud or other impurities that are introduced from the shell side inlet, all of which enhances the thermal efficiency and decreases corrosion in the heat exchanger.

Further, A 35 U.S.C. §102(b) rejection is only proper when directed toward an invention that is *identically* disclosed or *identically* described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the...claim." *Richardson v. Suzuki Motor Co.*, 868 F. 2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Thus, the present invention is not anticipated by Kieren because Kieren does not / *identically* disclose or *identically* describe the present invention. Therefore, Applicants

respectfully request that the 35 U.S.C. §102(b) rejection be withdrawn with respect to claims 1, 5, 9-12 and 17.

Claims 10-12 are also rejected under 35 U.S.C. §103 as being unpatentable over Kieren. The Examiner states that the device in Kieren discloses all the claimed features with the exception of the specifically claimed fluids. Further, Examiner states that it would have been obvious to one skilled in the art at the time the invention was made to have the specifically claimed fluids, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

Applicants traverse the rejection with regard to Kieren for the same reasons discussed above in association with the 35 U.S.C. §102(b) rejection. Also, claim 9 relates to a method for introducing or discharging part or the whole of the second fluid through a drain pipe and /or a vent pipe set forth in claim 1. Claim 10 depends on claim 9, and claims 11 and 12 depend on claim 10. These claims relate to method claims, i.e., use claims, so that a polymerizable substance or the substance flowing through a tube and shell heat exchanger would be used.

Kieren relates to feed-water heaters and purifiers and the removal of impurities from water fed to boilers or other uses (column 1, lines 10-13). Kieren does not teach or suggest the use of any easy polymerizable substances such as acrylic acid and methacrylic acid. Thus the invention defined by the present invention is not taught or suggested by Kieren.

The Examiner also states in Communication paper No. 12 page 3, that it is known to have a polymerizable substance used in a tube and shell heat exchanger (see Grobe et al. (3, 520, 661) and Yamaguchi et al. (5, 048, 601)).

Applicants respectfully traverse because Grobe et al. does not teach or suggest a vent and/or drain pipe structure, as defined in the present invention. In addition, the

subject fluid to be treated is different from the present invention in that the present invention aims to treat the second fluid through the shell. In contrast, Grobe et al. aim to treat the first fluid flowing through the tube of the present invention. Further, Grobe et al. teaches away from the present invention by teaching a process and apparatus for polymerization. In contrast, in accordance with the present invention, polymerization can be prevented. In the construction of Grobe et al., the problems overcome by the present invention would not occur. Thus, Grobe et al. do not cure the teachings of Yamaguchi et al. and the present invention is neither taught nor suggested by Yamaguchi et al. and Grobe et al., alone or in combination thereof.

Furthermore, in regard to the Examiner's comments toward the obviousness of the claimed fluids, the Examiner has not brought forth any evidence that suggests that it would have been obvious to one skilled in the art at the time the invention was made to have the specifically claimed compounds. Absent such a showing of evidence, the Examiner has impermissibly used "hindsight" by using the Applicant's teaching as a blueprint to hunt through the prior art for the claimed elements and combine them as claimed. *In re Zurko*, 111 F.3d 887, 42 USPQ2d 1476 (Fed. Cir. 1997); *In re Vaeck*, 947 F.2d 488, 20 USPQ2D 1438 (Fed. Cir. 1991). Such an approach would be "an illogical and inappropriate process by which to determine patentability." *Sensonic, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570, 38 USPQ2d 1551, 1554 (Fed. Cir. 1996).

Based on the foregoing, Applicants respectfully request that the 35 U.S.C. §103 rejection be withdrawn with respect to claims 10-12.

The application is now believed to be in a condition for allowance and an early notification thereof is respectfully requested. The Examiner is invited to contact the undersigned should she believe this would expedite prosecution of this application. It is believed no fee is required.

The Commissioner is authorized to charge any deficiency or credit any overpayment to Deposit Account No. 13-2165.

Respectfully submitted,



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